Ling 566
Oct 24, 2017

Binding Theory, Imperatives

Overview

- Review of Ch 1 informal binding theory
- What we already have that's useful
- What we add in Ch 7 (ARG-ST, ARP)
- Formalized Binding Theory
- Binding and PPs
- Examples
- Imperatives
- Reading questions

Some Examples from Chapter 1

- *She likes herself*
- **She$_i$ likes her$_i$.*
- *We gave presents to ourselves.*
- **We gave presents to us.*
- *We gave ourselves presents*
- **We gave us presents.*
- **Leslie told us about us.*
- *Leslie told us about ourselves.*
- **Leslie told ourselves about us.*
- **Leslie told ourselves about ourselves.*

Some Terminology

- Binding: The association between a pronoun and an antecedent.
- Anaphoric: A term to describe an element (e.g. a pronoun) that derives its interpretation from some other expression in the discourse.
- Antecedent: The expression an anaphoric expression derives its interpretation from.
- Anaphora: The relationship between an anaphoric expression and its antecedent.

The Chapter 1 Binding Theory Reformulated

- Old Formulation:
  - A reflexive pronoun must be an argument of a verb that has another preceding argument with the same reference.
  - A nonreflexive pronoun cannot appear as an argument of a verb that has a preceding coreferential argument.
- New Formulation:
  - Principle A (version I): A reflexive pronoun must be bound by a preceding argument of the same verb.
  - Principle B (version I): A nonreflexive pronoun may not be bound by a preceding argument of the same verb.

Some Challenges

- Replace notions of "bound" and "preceding argument of the same verb" by notions definable in our theory.
- Generalize the Binding Principles to get better coverage.

A Question

- What would be a natural way to formalize the notion of "bound" in our theory?

- Answer: Two expressions are bound if they have the same INDEX value ("are coindexed").

Two More Questions

- Where in our theory do we have information about a verb's arguments?
- Answer: In the verb's VALENCE features.
- What determines the linear ordering of a verb's arguments in a sentence?
- Answer: The interaction of the grammar rules and the ordering of elements in the COMPS list.

The Argument Realization Principle

- For Binding Theory, we need a single list with both subject and complements.
- We introduce a feature ARG-ST, with the following property (to be revised later):

$$\begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{VAL} & \begin{bmatrix} \text{SPR} & \boxed{A} \\ \text{COMPS} & \boxed{B} \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \boxed{A} \oplus \boxed{B} \end{bmatrix}$$

- This is a constraint on the type word

Notes on ARG-ST

- It's neither in SYN nor SEM.
- It only appears on lexical heads (not appropriate for type *phrase*)
- No principle stipulates identity between ARG-STs.

Two Bits of Technical Machinery

- Definition: If *A* precedes *B* on some ARG-ST list, then *A* **outranks** *B*.

- Elements that must be anaphoric -- that is, that require an antecedent -- are lexically marked **[MODE ana]**. These include reflexive pronouns and reciprocals.

The Binding Principles

- Principle A: A [MODE ana] element must be outranked by a coindexed element.

- Principle B: A [MODE ref] element must not be outranked by a coindexed element.

Pronoun-Antecedent Agreement

- The Binding Principles by themselves don't block:
  * *I amused yourself.*
  * *He amused themselves.*
  * *She amused himself.*
- Coindexed NPs refer to the same entity, and AGR features generally correlate with properties of the referent.
- The Anaphoric Agreement Principle (AAP):
  Coindexed NPs agree.

Binding in PPs

- What do the Binding Principles predict about the following?

I brought a book with me.

**I brought a book with myself.*

**I mailed a book to me.*

I mailed a book to myself.

Two Types of Prepositions: the Intuition

- "Argument-marking": Function like case-markers in other languages, indicating the roles of NP referents in the situation denoted by the verb.
- "Predicative": Introduce their own predication.

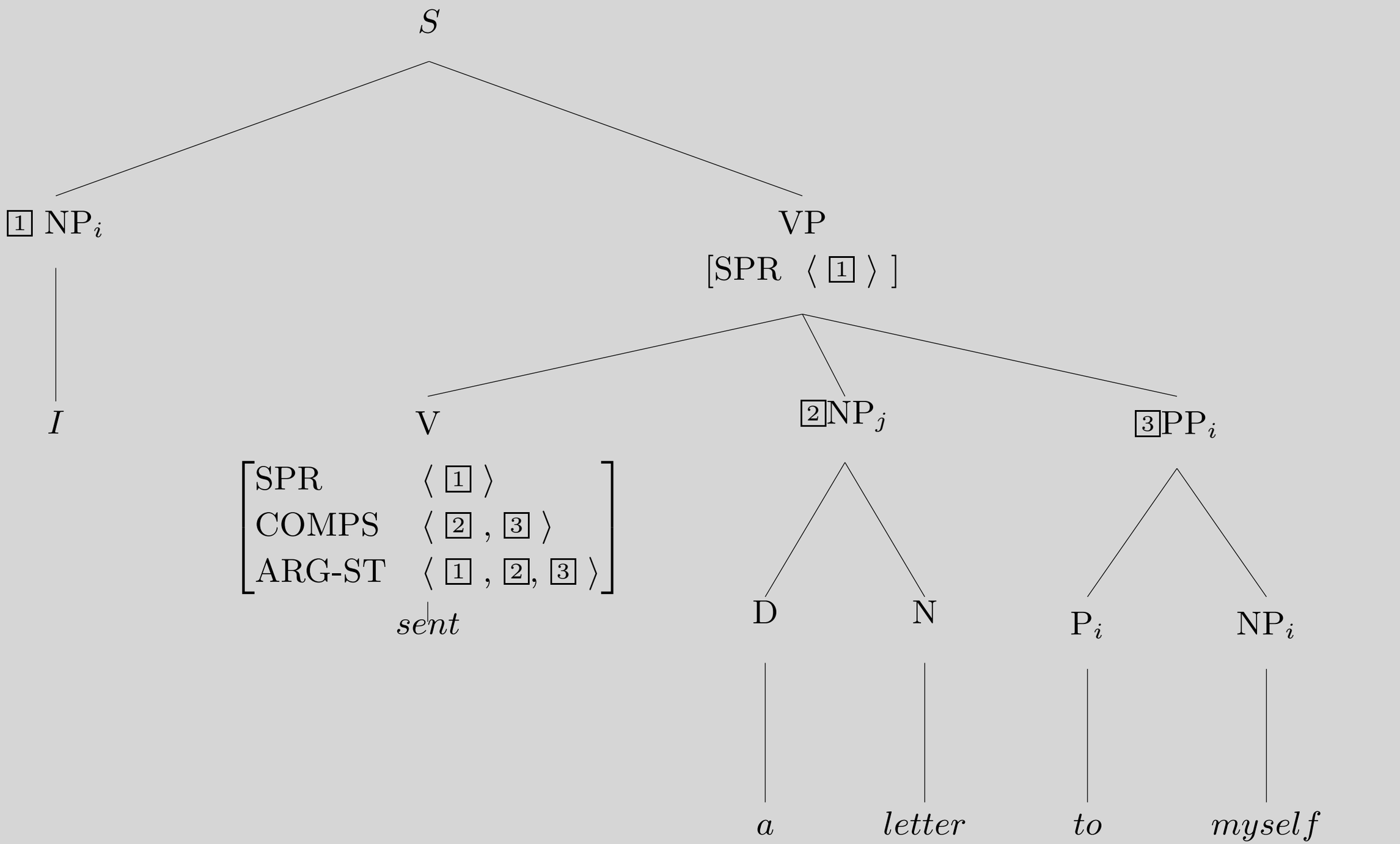
Two Types of Prepositions: a Formalization

- Argument-marking prepositions share their objects' MODE and INDEX values.
  - This is done with tagging in the lexical entries of such prepositions.
  - These features are also shared with the PP node, by the Semantic Inheritance Principle.
- Predicative prepositions introduce their own MODE and INDEX values.

Redefining Rank

- If there is an ARG-ST list on which *A* precedes *B*, then *A* outranks *B*.
- If a node is coindexed with its daughter, they are of equal rank -- that is, they outrank the same nodes and are outranked by the same nodes.

An Example

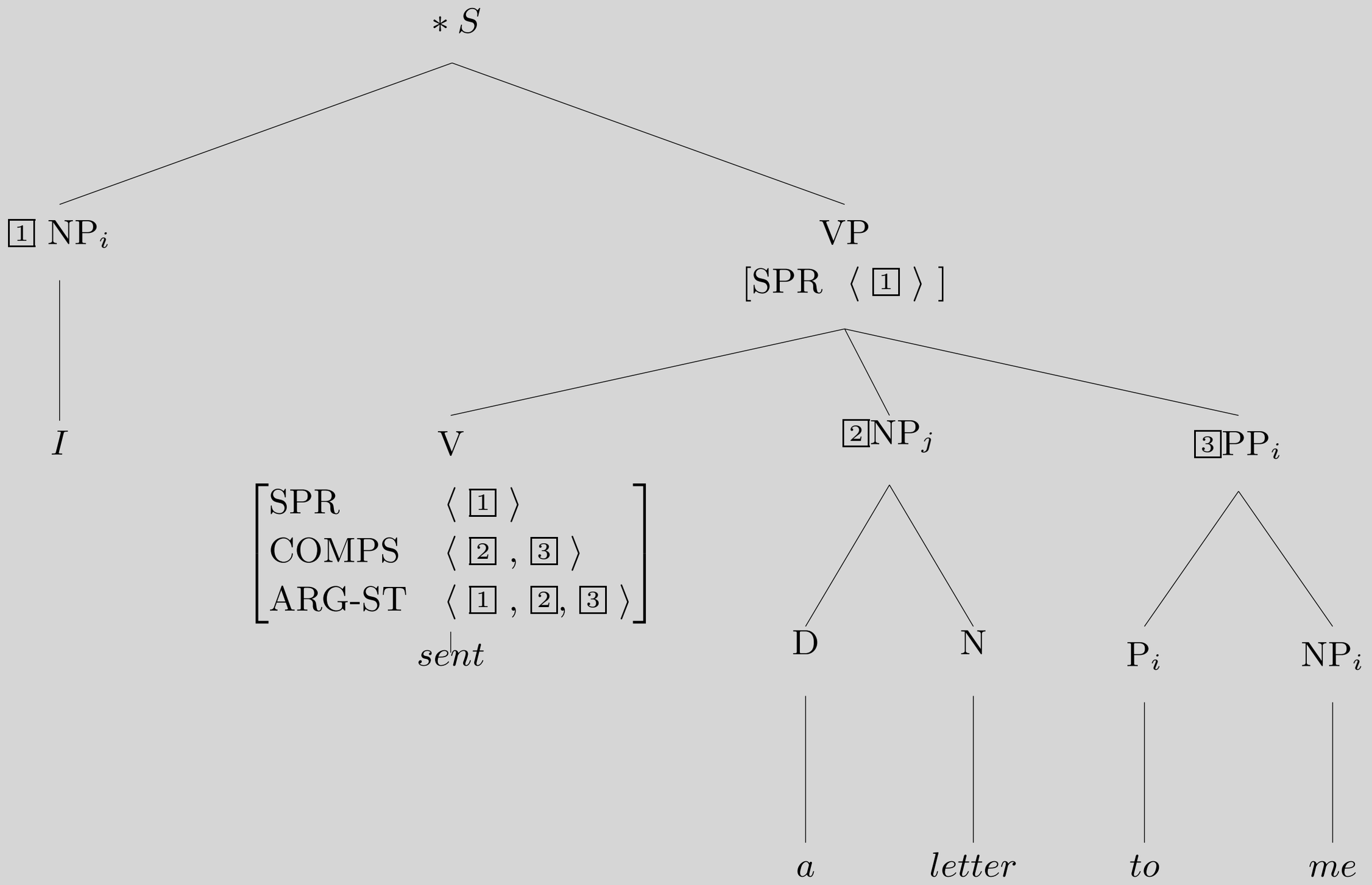


The ARG-ST

$$\left[\text{ARG-ST}\ \left\langle \begin{bmatrix}\text{NP}_i\\ \text{MODE ref}\end{bmatrix}, \begin{bmatrix}\text{NP}_j\\ \text{MODE ref}\end{bmatrix}, \begin{bmatrix}\text{PP}_i\\ \text{MODE ana}\end{bmatrix}\right\rangle\right]$$

- The PP is outranked by the first NP. (Why?)
- *myself* has the same rank as the PP. (Why?)
- So, *myself* is outranked by the first NP. (Why?)
- Therefore, Principle A is satisfied.

Replacing *myself* with *me*

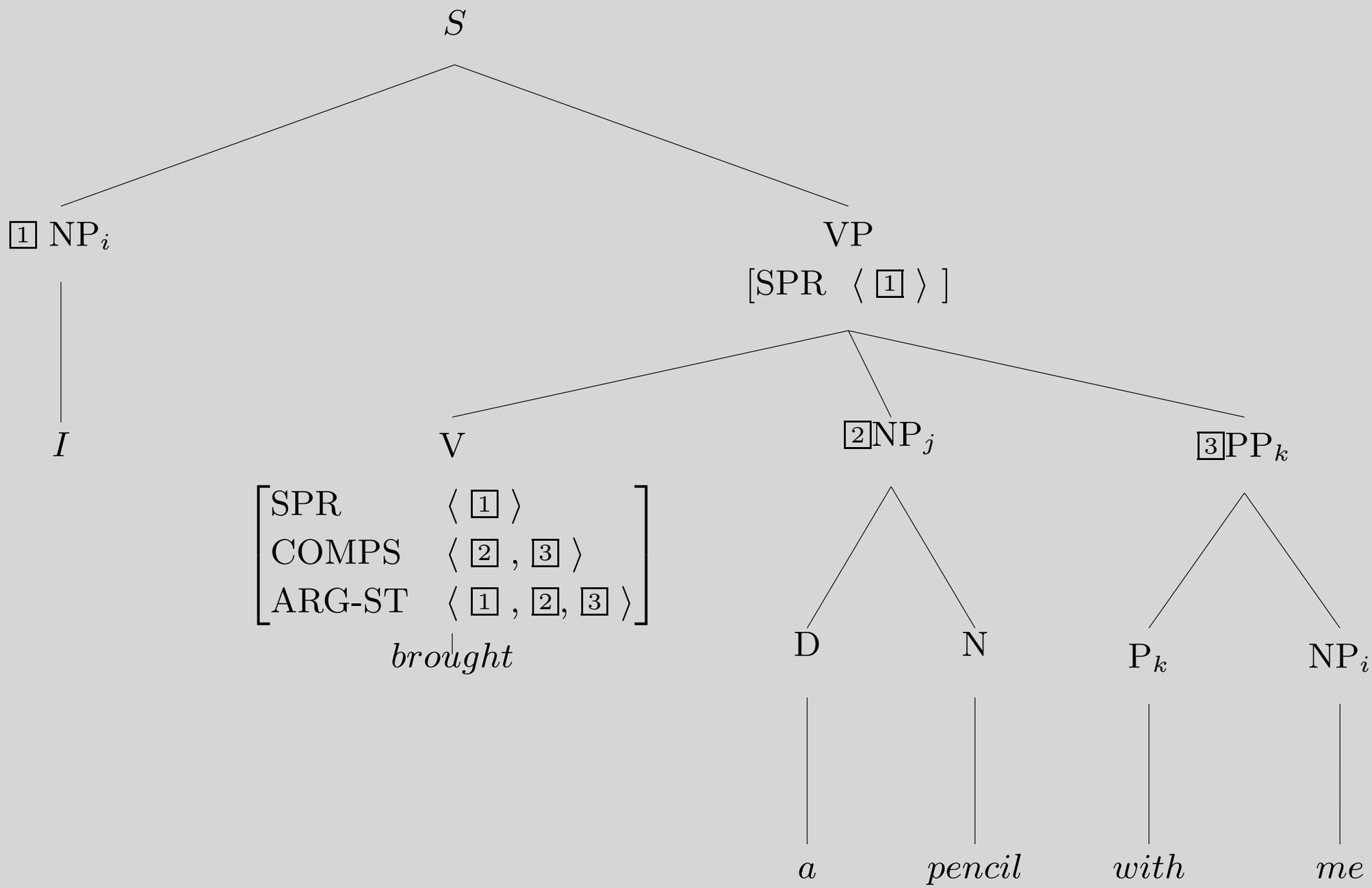


The ARG-ST

$$\left[\text{ARG-ST}\ \left\langle \begin{bmatrix}\text{NP}_i\\ \text{MODE ref}\end{bmatrix}, \begin{bmatrix}\text{NP}_j\\ \text{MODE ref}\end{bmatrix}, \begin{bmatrix}\text{PP}_i\\ \text{MODE ref}\end{bmatrix} \right\rangle\right]$$

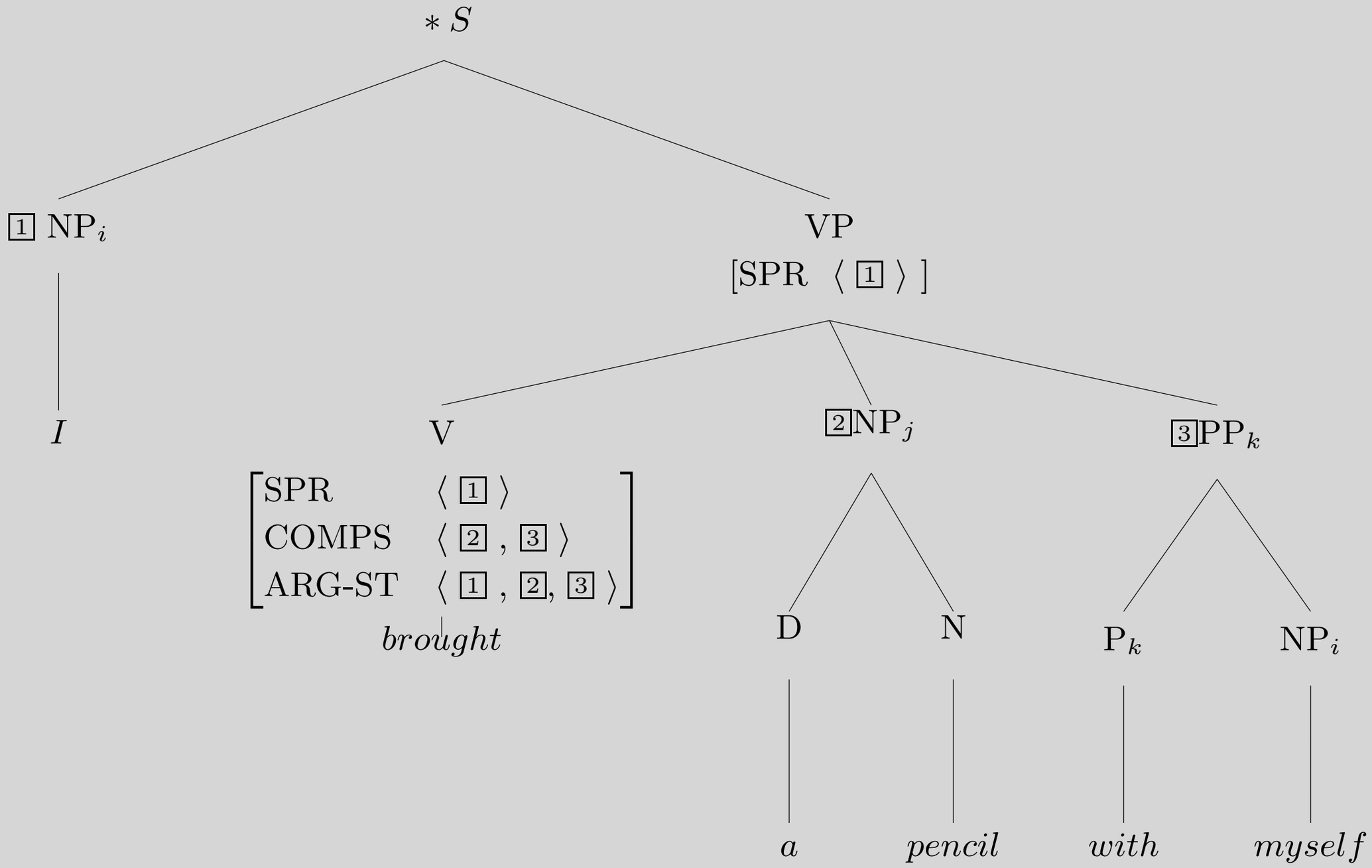
- The PP is outranked by the first NP.
- *me* has the same rank as the PP.
- So, *me* is outranked by the first NP.
- Therefore, Principle B is violated.

Another Example



- Here *I* does not outrank *me*, so Principle B is satisfied.

Replacing *me* with *myself*



- Here *I* does not outrank *myself*, so Principle A is violated.

Imperatives

- Have the internal structure of a VP

  Leave!
  Read a book!
  Give the dog a treat!
  Put the ice cream in the freezer!

- Function as ***directives***
- Have the verb in base form

  Be careful! not **Are careful!*

- Allow 2nd person reflexives, and no others

  Defend yourself! vs. **Defend myself/himself!*

The Imperative Rule

$$\begin{bmatrix} \textit{phrase} \\ \text{HEAD} \quad \textit{verb} \\ \text{VAL} \quad \begin{bmatrix} \text{SPR} \quad \langle\, \rangle \end{bmatrix} \\ \text{SEM} \quad \begin{bmatrix} \text{MODE} \quad \text{dir} \\ \text{INDEX} \quad s \end{bmatrix} \end{bmatrix} \rightarrow \bigcirc \begin{bmatrix} \text{HEAD} \quad \begin{bmatrix} \textit{verb} \\ \text{FORM} \quad \text{base} \end{bmatrix} \\ \text{VAL} \quad \begin{bmatrix} \text{SPR} \quad \left\langle \text{NP}\left[\text{PER} \quad \text{2nd}\right] \right\rangle \\ \text{COMPS} \quad \langle\, \rangle \end{bmatrix} \\ \text{SEM} \quad \begin{bmatrix} \text{INDEX} \quad s \end{bmatrix} \end{bmatrix}$$

- Internal structure of a VP
- Directive function
- Base form
- Only 2nd person reflexives

- Note that this is not a headed rule. Why?
- Answer: It would violate the HFP and the SIP.

Imperative example (Combining constraints again)

What's the SPR value on S?

Why?

What's the SPR value on VP?

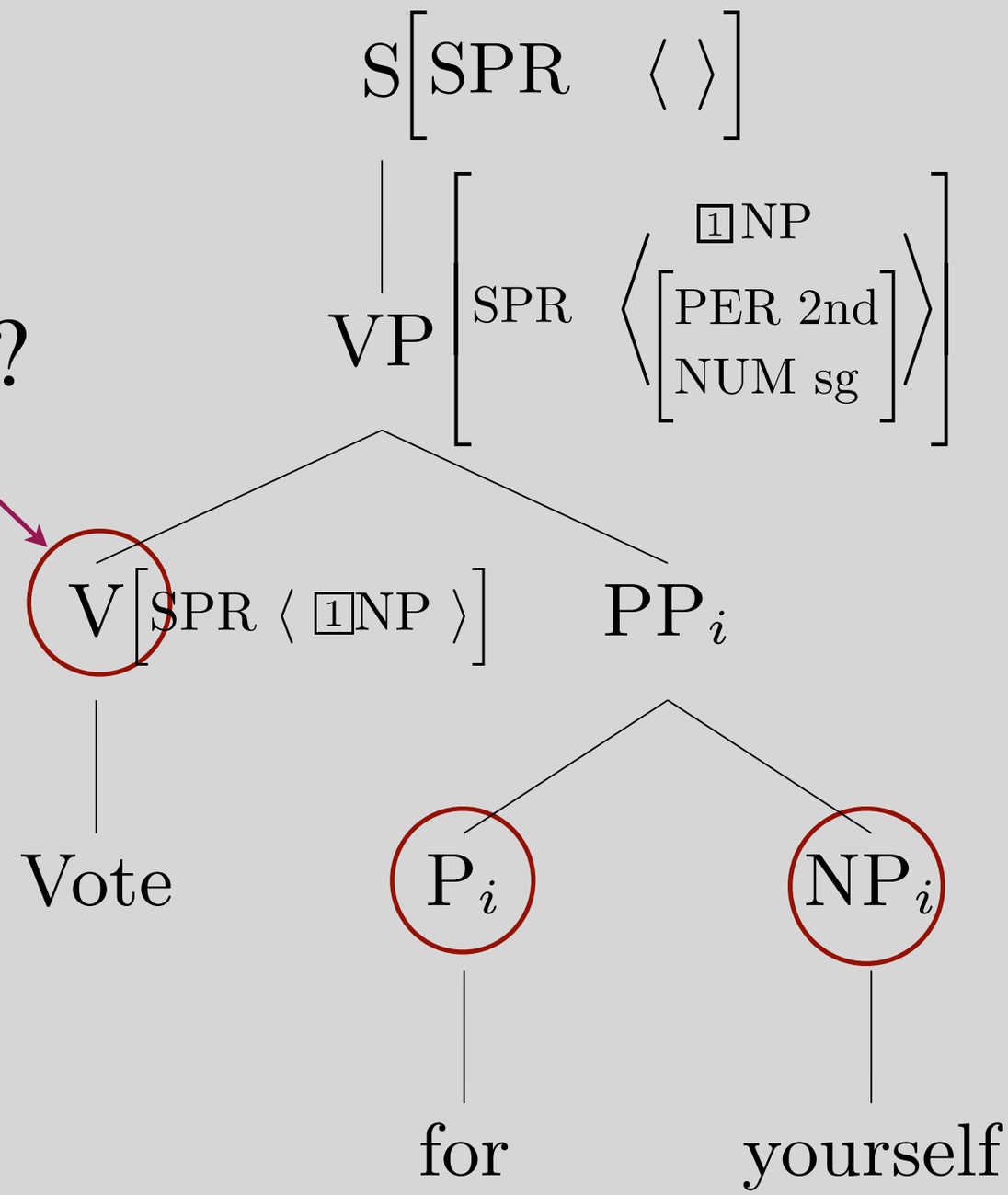
Why?

What's the SPR value on V?

Why?

Which nodes have ARG-ST?

Which ARG-ST matters for the licensing of yourself?



ARG-ST on *vote*

$$\left\langle \overset{\mathrm{NP}_i}{\begin{bmatrix} \mathrm{PER} & \mathrm{2nd} \\ \mathrm{NUM} & \mathrm{sg} \end{bmatrix}}, \overset{\mathrm{PP}_i}{\begin{bmatrix} \mathrm{MODE} & \mathrm{ana} \end{bmatrix}} \right\rangle$$

- Is Principle A satisfied?
- How?
- Is Principle B satisfied?
- How?

Day 1 Revisited

- Recall

F---- yourself!	*F---- you!*
Go f---- yourself!	**Go f---- you!*

- *F--- NP!* has two analyses
  - As an imperative
  - As a truly subjectless fixed expression.

- *Go f---- NP!* can only be analyzed as an imperative.

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Reading Questions

- How is it okay to leave that SPR value that the verb was looking for unrealized in the Imperative Rule?
- Without a subject, how would our grammar handle valid cases of this exclamation, ex: *Damn these vampires!*?
- What is to keep the grammar from analyzing *Damn him* as an understood occurrence of *You damn him* rather than the implied reference to some higher power doing the damning. Do we care?

The Imperative Rule

$$\begin{bmatrix} \textit{phrase} & \\ \text{HEAD} & \textit{verb} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \text{dir} \\ \text{INDEX} & s \end{bmatrix} \end{bmatrix} \rightarrow \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \textit{verb} \\ \text{FORM} & \text{base} \end{bmatrix} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \left\langle \text{NP}\left[\text{PER} \quad \text{2nd}\right] \right\rangle \\ \text{COMPS} & \langle\ \rangle \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{INDEX} & s \end{bmatrix} \end{bmatrix}$$

Reading Questions

- Isn't ARG-ST redundant?
- I'm looking for a bit more explanation for the motivation to restrict ARG-ST to words and to place it in neither SYN nor SEM.
- Why does MOD have no impact on the ARG-ST list?

Reading Questions

- We know that ARG-ST is sum of SPR and COMPS. But in (28), SPR is null and COMPS is not specified. Where does the ARG-ST get its value from then?

(28)

$$\left\langle \text{to}\ , \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \textit{prep} \\ \text{VAL} & \begin{bmatrix} \text{SPR} & \langle\ \rangle \end{bmatrix} \end{bmatrix} \\ \text{ARG-ST} & \left\langle \begin{bmatrix} \text{SYN} & \begin{bmatrix} \text{HEAD} & \begin{bmatrix} \text{CASE} & \text{acc} \end{bmatrix} \end{bmatrix} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \boxed{1} \\ \text{INDEX} & \boxed{2} \end{bmatrix} \end{bmatrix} \right\rangle_{\text{NP}} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \boxed{1} \\ \text{INDEX} & \boxed{2} \end{bmatrix} \end{bmatrix} \right\rangle$$

Reading Questions

- If, in a lexical entry, the ARG-ST feature is fully specified, do we also need to fill out the SPR and COMPS lists?
- It is stated that ARG-ST is a feature of words and not phrases. Is that reason that ARG-ST does not get passed up to phrases because there is no rule that licenses it to do so? Is that reason that ARG-ST does not get passed up to phrases because there is no rule that licenses it to do so?

Reading Questions

- Why did we have to add part (i) of our definition of outrank? What about Principles A & B would break if we didn't?
- In part (ii) why the use of *an*? Isn't there only one ARG-ST list that's relevant -- the one on the verb?

(30) (i) If a node is coindexed with its daughter, their feature structures are of equal rank.
(ii) If there is an ARG-ST list on which *A* precedes *B*, then *A* has a higher rank than (i.e. outranks) *B*.

Reading Questions

- What's the difference between coindexed and coreferential? How does this relate to values of variables in programming languages?
- To express the semantics of anaphora across multiple sentences, do we simply give them the same index (coindexing)?

Reading Questions

- What is meant by *predicate* when we say that some Ps function as predicates and others don't? *Around* is stated to be a separate predicate in *The house had a fence around it*, but not in *To make a noose, you wind the rope around itself*.

Reading Questions

- Does this mean that this preposition will have ARG-ST in its node to collect information from other nodes (such as the NP)? Also, do all the nodes in a tree have ARG-ST in them?

$$\begin{bmatrix} \text{ARG-ST} & \left\langle \begin{bmatrix} \text{NP} \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \boxed{1} \\ \text{INDEX} & \boxed{2} \end{bmatrix} \end{bmatrix} \right\rangle \\ \text{SEM} & \begin{bmatrix} \text{MODE} & \boxed{1} \\ \text{INDEX} & \boxed{2} \\ \text{RESTR} & \langle\ \rangle \end{bmatrix} \end{bmatrix}$$